

Eighteenth Annual Single Event Effects Symposium Preliminary Technical Program
April 20-22, 2009

Sunday, April 19

5:00 - 8:00 PM Registration/ Reception

Monday, April 20

7:00 - 8:00 AM Continental Breakfast

8:00 AM R. Velazco

8:05 AM S. McClure

Welcome and Local Arrangements

Introduction to Technical Program

Invited Talk

8:10 AM Dave Hansen

A Design of Experiments Approach to Technology Characterization

Session A:	SEE Mechanisms and Modeling	Chair: Jonathan Pellish
8:40 AM	B. Sierawski, R. Reed, R. Schrimpf, R. Weller, M. Mendenhall, J. Pellish, J. Black, M. Xapsos, R. Baumann, X. Deng	MODELING LOW-ENERGY PROTON INDUCED SINGLE EVENT UPSETS
9:00 AM	R. Weller, R. Reed, K. Warren, M. Mendenhall, B. Sierawski, R. Schrimpf, L. Massengill	Proposed Criteria for Using Advanced Physical Modeling for Rate Prediction of Single Event Effects
9:20 AM	K. Lilja	Single Event Cross-Section and Error-Rate Prediction for Digital Logic Using Accurate Simulation
9:40 AM	R. Shi	SEE-CHA: An Electronic Design Automation Tool for Characterization of Single Event Effects in Nanoscale Mixed-Signal Integrated Circuits

10:00 AM Break

10:00 AM - 10:00 PM Industrial Exhibits Open

Session B:	SET Mechanisms and Modeling	Chair: Stephen (Steve) Buchner
10:20 AM	M. Turowski, A. Fedoseyev, A. Raman, D. McMorrow, J. Boos	Mixed-Mode 3D Modeling of Single Event Effects in III-V High Electron Mobility Transistors (HEMTs)
10:40 AM	V. Ferlet-Cavrois, D. McMorrow, P. Paillet, J. Melinger	High-Resolution SET Pulse Width Measurement in Chains of Inverters Using Pulsed Laser Irradiation
11:00 AM	N. Atkinson, A. Witulski, W. Holman, B. Bhuvan, J. Black, L. Massengill	The SE response of multiple-finger transistors

11:20 AM P. Maillard, T. Loveless, W. Holman, B. Bhuva, L. Massengill Single-Event-Transient Analysis of Delay-locked Loops

11:40 AM J. Pellish, R. Reed, D. McMorrow, G. Vizkelethy, S. Phillips, A. Sutton, R. Diestelhorst, J. Cressler, P. Dodd, M. Alles, R. Schrimpf, P. Marshall, K. LaBel Heavy Ion Current Transients in SiGe HBTs

12:00 PM **Lunch**

Invited Talk

1:10 PM Dale McMorrow Ionization-Induced Carrier Transport and Collection in Next-Generation III-V Structures

Session C:	RHBD Methods and Evaluation	Chair: Jeremy Popp
1:40 PM	R. Lawrence, J. Ross, N. Haddad, M. McMahan-Norris, R. Reed, D. Albrecht	Proton Induced Soft Error Sensitivities in 90nm Bulk CMOS SRAMs
2:00 PM	S. Nation, J. Popp, J. Braatz, B. Olson, D. Loveless, L. Massengill	Analysis and Testing of a Radiation Hardened by Design SerDes Transmitter Driver in 90nm CMOS
2:20 PM	J. Popp, Y. Wei, C. Shi	Single Event Upset Performance of a Radiation Hardened by Design 90nm CMOS Phase Locked Loop with LC-tank Voltage Controlled Oscillator
2:40 PM	K. Warren, A. Sternberg, J. Black, R. Weller, R. Reed, M. Mendenhall, R. Schrimpf, L. Massengill	Heavy Ion Testing and Single Event Upset Rate Prediction Considerations for Hardened by Design Circuitry

3:00 PM **Break**

Invited Talk

3:20 PM John Cressler The Path to Understanding and Mitigating SEE in SiGe Technology

Session D:	Devices and ICs: Mixed Signal	Chair: Philipe Adell
3:50 PM	K. Kruckmeyer	Effect of Total Ionizing Dose Radiation Hardening on the Single Event Transient (SET) Response of National Semiconductor's ELDRS-free LM139 Quad Comparator
4:10 PM	S. Buchner, N. Roche, M. Bernard, L. Dusseau, D. McMorrow	The Effects of Total Ionizing Dose on Single Event Effects
4:30 PM	B. Olson, W. Holman, B. Bhuva, L. Massengill	Single Event Analysis of Digital Encoders for Flash and Pipelined Analog-to-Digital Converters
4:50 PM	G. Siddhartha, H. Barnaby, B. Vermeire, J. Hofmeister	Single Event Transients in Switched Capacitor Circuits

6:00 PM - 10:00 PM **Reception/ Industrial Exhibit**

Tuesday, April 21

7:00-8:00 AM Continental Breakfast

Invited Talk

8:00 AM Oluwole Amusan

The Impact of Charge Sharing on Single Event Upsets in Deep-Submicron Circuits

8:30 AM AJ Kleinosowski

Rad-Hard by Design Complex Processor with Embedded Single Event Effects Instrumentation

Session E:	Devices and ICs: Memory	Chair: Craig Hafer
9:00 AM	D. Heidel, J. Pellish, P. Marshall, K. Rodbell, Proton and heavy ion testing of 45 nm and 65 nm SOI SRAMs K. LaBel, J. Schwank, M. Hakey, M. Berg, P. Dodd, M. Friendlich, A. Phan, C. Seidleck, M. Shaneyfelt, M. Xapsos	
9:20 AM	C. Hafer, M. Von Thun, J. Mabra, F. Sievert Testing Memory Devices for Single Event Effects	
9:40 AM	P. Adell, R. Mc Peak, L. Scheick, S. Guertin An Approach to Single Event Testing of SDRAMs	
10:00 AM	Ray Ladbury	SDRAMs for Space: The Next Generation
10:20 AM	Break	
10:40 AM	M. Xapsos, K. LaBel, J. Pellish, H. Kim, M. Campola, M. Friendlich, A. Phan, X. Deng, A. Marshall, R. Baumann, R. Reed, A. Tipton	Discrete and Solid Angle SEU/MBU Test Results for Texas Instruments 65 nm CMOS SRAMs
11:00 AM	F. Irom, D. Nguyen	Catastrophic Failure in Highly Scaled Commercial NAND Flash Memories
11:20 AM	S. Doyle, J. Ross, N. Haddad, R. Lawrence, E. Chan	Advanced Rad Hard SRAM Qualification and SEE Test Results
11:40 AM	B. Vermeire, N. Gupta, H. Barnaby, M. Goksel, E. Li, D. Czajkowski, D. Bozek, D. Strobel	Radiation Hardened 4G NAND Flash Memory
12:00 PM	Lunch	

Invited Talk

1:10 PM Vincent Pouget

Laser testing for single-event effects: best practices and new challenges with advanced technologies

1:40 PM Dan Alexandrescu

Dealing with Soft-Errors in Complex Electronic Systems

Session F:	Devices and ICs: Processors	Chair: Farokh Irom
2:10 PM	S. Guertin, F. Irom	Processor SEE Test Design
2:30 PM	M. Cabanas-Holmen, C. Neathery, E. Cannon, AJ Kleinosowski, R. Brees, J. Clement, W. Snapp	MAESTRO Radiation-Tolerant Polymorphic Computing Architecture (PCA) Processor Chip
2:50 PM	Break	
3:10 PM - 5:10 PM	Panel Discussion	SEE Testing Challenges: Complex Devices (SoC, Multi-core, Large Memory, Bridge chips)
6:00 PM - 8:00 PM	Happy Hour	

Wednesday, April 22

7:30 - 8:30 AM Continental Breakfast

Invited Talk

8:30 AM	Dave Mavis	New Test and Analysis Methods for SEE Characterization
9:00 AM	George Vizkelethy	Radiation Effects Microscopy using a cyclotron based Ion Photon Emission Microscope

Session G:	Devices and ICs: Reconfigurable	Chair: To be announced
9:30 AM	M. Berg	The Benefits and Limitations of SRAM Based Field Programmable Gate Array Fault Injection
9:50 AM	S. Rezgui, R. Won, D. D'Silva, J. McCollum, J	SET Propagation in 90-nm Test Structures

10:10 AM **Break**

Session H:	Test Issues and Methods	Chair: Sandra Liu
10:30 AM	J. Pellish, P. Marshall, M. Berg, A. Phan, K. LaBel, R. Reed, R. Weller, M. Mendenhall, B. Sierawski	Low-Energy Proton Testing Methodology
10:50 AM	J.-M. Lauenstein, H. Kim, S. Potbhare, A. Phan	Impact of Total Ionizing Dose on Single-Event Gate Rupture Susceptibility in a Commercial Power VDMOSFET
11:10 AM	S. Liu, J. Titus, M. Zafrani, H. Cao, D. Carrier, P. Sherman	Worst-Case Test Conditions for SEGR of Power DMOSFETs
11:30 AM	D. Cardoza, S. D. LaLumondiere, W. T. Lotsh	Ambient Condition Ultrafast X-Ray Source for Single Event Effects Testing
11:50 AM	K. LaBel	You're Doing It All Wrong! SEE Testing by Incidents and Accidents
12:10 PM	End of Technical Session	
2:00 PM	Volleyball Session	Contact Dave Strobel